PROJECT TITLE : Nitrate Reduction by Controlled Fermentation

PERIOD COVERED : June 27th - July 25th

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1. TRIALS

The first extended period of trials ended on July 11th after three months of continuous run. Since then the equipment has been cleaned and overhauled (Ref. 1).
A progress report about this period is in preparation.

1.1. Trial NINO 60

An infection located in the fermenter was reported the previous month (Ref. 2). Because of the continuous running mode of the fermenter any microorganisms still present were diluted to infinity. At subsequent checks no infection could be verified, in other words the infection disappeared without any further intervention. The trial NINO 60 was terminated on June 30th.

1.2. Trial NINO 61

1.2.1. This trial ran from July 1st to 11th. The objective was to increase the temperature of the fermenter in order to reduce the amount of cooling water. Temperatures between 30°C and 38°C were tried and only a residual amount of 10 ppm NO_3-N was found after fermentation. The average concentration of NO_3-N before the fermenter was about 860 ppm.
As compared to 30°C the need for cooling water is 50% reduced at 38°C.

1.2.2. In average the fermentation produces about 18 g of dry NINOMASS per kg of extract. Since the first trials in the pilot plant, the centrifuge was adjusted in order to obtain a NINOMASS as consistent as possible. But this resulted in a bad separation, about 55% of the insoluble solids were still left in the centrifuged extract. After optimization of the separation more than 95% of the NINOMASS was removed from the fermented extract. On the other hand, the NINOMASS as separated now, contains much more extract. A good compromise seems not possible with this centrifuge. A very significant part of extract could be recovered from the NINOMASS by rotary vacuum filter.
The mass balance of the centrifugation with the new working conditions is shown below : all numbers are related to 10 kg of dry weight feedstock.

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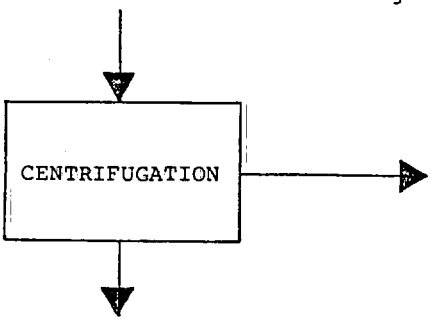
Fermented extract

total flow : 80 kg
insoluble solids : 1.50 kg
total solids : 3.92 kg



NINOMASS

total flow : 26.5 kg
insoluble solids : 1.45 kg
total solids : 2.31 kg

Centrifuged extract

total flow : 53.5 kg
insoluble solids : 0.05 kg
total solids : 1.61 kg

2. NINO SCALE-UP

The NINO/RL engineering study from PEC was received on July 17th and is now being studied.

3. PILOT PLANT

See monthly report of July 1980 : "Pilot Plant Operations" by N. Lüthi.

4. NINOMASS

4.1. 150 kg of dried NINOMASS were sent to V L G Z for use as animal feed.
See also monthly report of July 1980 : "Unit Operation I" by P. Karbacher.

4.2. During the last week of trial NINO 61 we produced about 20 kg of dried NINOMASS which was sent to PM USA in Richmond and Miller Brewery in Milwaukee on request of the research department. Some analytical results are listed below in comparison with data of a dried but unwashed NINOMASS as used by V L G Z for their trial.

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		unwashed NINOMASS (Ref. 5 and 6)	washed NINOMASS (Ref. 3 and 4)
O.V.	%	4.5	5
ashes	%	11.6	9.4
potassium	%	9.3	3.2
calcium	%	1.1	0.5
magnesium	%	0.4	0.1
nicotine	ppm	433	92
tot. nitrogen	%	not available yet	7.0

5. NINO/RCB

About 250 kg of concentrated extract without NINOMASS produced during trial NINO 61 were recombined with washed stems in trials NINO/RCB No. 9 - 11 in Onnens.
See also monthly report : "Reconstituted Tobacco", July 1980, by P. Karbacher.

6. REFERENCES

Ref. 1 : Monthly report : "Pilot Plant Operations", July 1980, N. Lüthi.

Ref. 2 : Monthly report : "Nitrate Reduction by controlled Fermentation", June 1980, C. Ruf.

Ref. 3 : Résultats d'analyse, July 16th, from F. Moser to C. Ruf.

Ref. 4 : Résultats d'analyse, July 17th, from A. Haenggi to C. Ruf.

Ref. 5 : Résultats d'analyse, July 17th, from F. Moser to P. Karbacher.

Ref. 6 : Résultats d'analyse, July 24th, from A. Widmer to P. Karbacher.

PROCESS DEVELOPMENT

C. Ruf

July 30th, 1980
CLR/sde

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